

# NATURAL RESOURCES CONSERVATION SERVICE

## CONSERVATION PRACTICE STANDARD

### Waste Utilization

(Acre)

Code 633

#### DEFINITION

Using agricultural wastes such as manure and wastewater or other organic residues.

#### PURPOSES

- Protect water quality
- Protect air quality
- Provide fertility for crop, forage, fiber production and forest products
- Improve or maintain soil quality
- Provide feedstock for livestock
- Provide a source of energy

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies where agricultural by-products including animal manure and contaminated water from livestock and poultry operations; composted dead animals; solids and wastewater from municipal treatment plants; and agricultural processing residues are generated, and/or utilized.

#### CRITERIA

##### General Criteria Applicable to All Purposes

All federal, state and local laws, rules and regulations governing management, pollution abatement, health, and safety shall be strictly followed. The owner or operator shall be responsible for securing all required permits or

approvals related to this standard, and for operating and maintaining any components in accordance with applicable laws and regulations.

Use of wastes shall be based on:

- Year 1 – existing analysis or book value,
- All subsequent years – the most current, available analysis, not to exceed 3 years.
- In the case of a daily spreading program, the material shall be sampled and analyzed at least once each year.

The nutrient content of wastes from new facilities shall be based on acceptable book values until an analysis is available. Book values are listed in the Agricultural Waste Management Field Handbook (AWMFH) Chapter 4.

As a minimum, the waste shall be tested for total N, NH<sub>4</sub>-N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O and % moisture or % solids. If applicable, NO<sub>3</sub>-N may also be needed. Where heavy metal and salt content of municipal waste water, sludge, seepage, and other waste is of concern, the material shall also be tested for metal concentration and electrical conductivity.

When agricultural by-products are land applied, application rates shall be consistent with the requirements of the Indiana (IN) Natural Resources Conservation Service (NRCS) Electronic Field Office Technical Guide (eFOTG) Standard (590) Nutrient Management.

Where wastes are to be spread on land not owned or controlled by the producer, the management plan, as a minimum, shall document any applicable land use agreements, the amount of

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material to be transferred and who will be responsible for the environmentally acceptable uses of the material.

Field applications of organic nutrients shall be delayed if precipitation capable of producing runoff and erosion is forecast.

A current soil test (not older than four (4) years) shall be used to develop plans.

#### **Additional criteria to protect water quality**

Wastes shall not be applied to frozen, snow-covered, or saturated soil when the risk for runoff exists from edge of field or via surface tile inlets.

When liquid wastes are applied, the application rate shall not exceed the soil infiltration rate, and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application. The maximum application rate at any one time shall not exceed 13,500 gallons per acre, and shall be decreased to minimize ponding, avoid runoff and minimize loss to subsurface tile. Known subsurface drains shall be monitored during application. Be prepared to stop or plug the tile flow as needed.

Setbacks for manure application shall be established and maintained according to **Table A**, unless more restrictive by state or local requirements.

To decrease a manure application setback from **Table A**, a properly designed and maintained filter strip must be established according to the IN NRCS eFOTG Standard (393) Filter Strip. Manure shall not be applied to a filter strip.

Waste shall not be applied on soils that are frequently flooded during the period when flooding is expected, as defined by the NRCS Soil Data Mart.

#### **Additional Criteria to Protect Air Quality**

Incorporate surface applications of manure or other organic by-products into the soil within 24

hours of application to minimize ammonia volatilization and the emission of odors.

When applying liquid forms of manure with irrigation equipment, select application conditions that will minimize ammonia volatilization and the emission of odors into the atmosphere (such as temperature inversion and the impact of prevailing wind direction to offsite resources). The basis for applying manure under these conditions shall be documented in the nutrient management plan.

Handle and apply poultry litter or other dry types of animal manure or other organic by-products when weather conditions are calm and there is less potential for blowing and emission of particulates into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

When sub-surface applied using an injection system, waste shall be placed at a depth and applied at a rate that minimizes leaks onto the soil surface, while minimizing disturbances to the soil surface and plant community.

All materials shall be handled in a manner to minimize the generation of particulate matter, odors and greenhouse gases.

#### **Additional criteria for providing fertility for crop, forage, fiber production and forest products**

Organic nutrients utilized for fertility of crop, forage, fiber production, and forest products, shall follow the IN NRCS eFOTG Standard (590) Nutrient Management.

Where municipal wastewater and solids are applied to agricultural lands, the single application or lifetime limits of heavy metals shall not be exceeded. The concentration of salts shall not exceed the level that will impair seed germination or plant growth. Municipal wastewater and solids are not to be applied to food crops that are directly consumed by humans.

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**Table A – Manure Application Setback Distances (in feet)**

Known Feature	Liquid - Injection or Single Pass Incorporation (liquid/solid)	Liquid – Incorporation*; Surface Application (solid or compost); or Surface Application to Pasture	Liquid - Surface Application	
			≤ 6% Slope; or Residue Cover	> 6% Slope
Public Water Supply Wells & Surface Intake Structures	500	500	500	500
Surface Waters of the State	25 <sup>1,2/</sup>	50 <sup>1,2/</sup>	100 <sup>1,2/</sup>	200 <sup>1,2/</sup>
Sinkholes	25 <sup>1,2/</sup>	50 <sup>1,2/</sup>	100 <sup>1,2/</sup>	200 <sup>1,2/</sup>
Wells	50 <sup>1,2/</sup>	50 <sup>1,2/</sup>	100 <sup>1,2/</sup>	200 <sup>1,2/</sup>
Drainage Inlets, including Water & Sediment Control Basins	5 <sup>1,2/</sup>	50 <sup>1,2/</sup>	100 <sup>1,2/</sup>	200 <sup>1,2/</sup>
Property Lines & Public Roads	0	10	50	50

All setback distances must be measured from the edge of the area of actual placement of manure on the land.

\*Liquid incorporation of manure in Table A means only manure that has been incorporated into the soil within twenty-four (24) hours of placement on the land.

<sup>1/</sup>If a properly designed and maintained filter strip, according to the IN NRCS eFOTG Standard (393) Filter Strip, is located between the application site and: surface waters of the state; any known well; the surficial opening or lowest point on any sinkhole; or any drainage inlet, including water and sediment control basins; then the setback is the width of the filter strip. The minimum width of the filter strip shall be 50 feet (see eFOTG 393).

<sup>2/</sup>The setback is ten (10) feet if a gradient barrier (such as a berm or spoil bank) is located between the application site and: surface waters of the state; any known well; the surficial opening or lowest point on any sinkhole; or any drainage inlet, including water and sediment control basins.

**Note:** The application setbacks for Concentrated Animal Feeding Operations (CAFOs) may be different. CAFO operators are required to use the most restrictive setback distance that applies to the Known Feature and the applicable method of application.

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**Additional criteria for improving or maintaining soil quality**

Wastes shall be applied at rates not to exceed the crop nutrient requirements or salt concentrations as stated above.

Residue management practices shall be used for maintenance of soil structure.

**Additional criteria for providing feedstock for livestock**

Agricultural organic nutrients used for feedstock shall be handled in a manner that preserves feed value. Poultry litter stored for this purpose shall be covered. An animal nutritionist shall develop rations utilizing the organic waste nutrients.

**Additional criteria for providing a source of energy**

Use of agricultural by-products for energy production shall be an integral part of the overall waste management system.

All energy producing components of the system shall be included in the waste management plan and provisions for utilization of residues of energy production identified.

Where the residue of energy production will be land applied for crop nutrient use or soil conditioning, the criteria listed above shall apply.

**CONSIDERATIONS**

Consider application methods and timing that reduce the risk of organic nutrients from being transported to ground and surface waters, or into the atmosphere. Suggestions include:

Consider avoiding fall and winter nitrogen application for spring seeded crops or delay application of fall-applied N until the soil temperature is below 50° F and use a nitrification inhibitor, if applicable.

Consider using cover crops to utilize and recycle residual nitrogen.

Consider not applying waste and/or taking appropriate precautions on soils that are occasionally flooded as defined by the NRCS Soil Data Mart.

Consider additional conservation practices to improve soil nutrient and water storage, infiltration, aeration, tilth, and diversity of soil organisms and to protect or improve water quality.

Consider not applying waste to soils when the potential for soil compaction and creation of ruts is high.

Consider the effect of this practice on the water budget, particularly where a shallow ground water table is present or in areas prone to runoff. Limit application to the volume of liquid that can be stored in the root zone.

Consider minimizing the impact of odors by making applications at times when temperatures are cool and air movement is minimal. If there is air movement occurring, make applications when the wind direction is away from neighbors. Additional setbacks may need to be considered.

Consider setbacks near buildings, residences or public use areas.

Consider utilizing wastes in a manner that minimizes disease potential from pathogens and other disease-causing organisms.

Consider prioritizing application areas of organic nutrients on gentle slopes located as far as possible from waterways including tile systems that directly outlet into water courses. When organic nutrients are applied on more sloping land or land adjacent to waterways, other conservation practices should be installed to reduce the potential for offsite transport of nutrients.

Consider applying organic nutrients on pastures and hayland soon after cutting or grazing before re-growth has occurred.

Consider modification of animal diets to reduce the manure nutrient content and to enhance the producer's ability to manage manure effectively.

Consider the net effect of waste utilization on greenhouse gas emissions and carbon sequestration.

## PLANS AND SPECIFICATIONS

Plans and specifications shall be in keeping with this practice standard and the IN NRCS eFOTG Standard (590) Nutrient Management, as applicable, and shall describe the requirements for applying the practice to achieve its intended purpose.

The management plan will be developed and will account for the utilization or other disposal of all animal by-products produced. All application areas shall be clearly identified on a plan map. A revision of the management plan is needed when the operation significantly changes due to:

- animal numbers;
- animal class, type or size;
- feed management; or
- organic by-product handling or storage.

## OPERATION AND MAINTENANCE

Records shall be kept for a period of five years or longer if required by other Federal, state, or local laws and regulations or program or contract requirements, and include when appropriate:

- Quantity of manure and other agricultural organic nutrients produced and their nutrient content;
- Soil test results for all fields where organic nutrients will be land applied;
- Dates, amounts, methods and locations of application when land applied, and the dates and amounts of materials removed from the system due to feeding, energy production, or export from the operation;
- Describe climatic conditions during waste application such as: time of day, temperature, humidity, wind speed, wind direction and other factors as necessary;
- Crops grown and yields (both yield goals and measured yield);
- Calibrate application equipment to meet planned application rates.

The operation and maintenance plan shall include the dates of periodic inspections and maintenance of equipment and facilities used to transport, apply or use the organic by-products. Periodic plan reviews are recommended annually to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be revised with each soil test cycle.

The plan shall include items to be inspected or maintained, and a general time frame for making necessary repairs.

Take extra caution when handling manure and other organic materials stored in unventilated enclosures. Workers shall be protected from and avoid unnecessary contact with manure and organic by-products. Protection shall include protective clothing and eyewear.

## REFERENCES

Listed below are references helpful in planning this practice:

- Confined Feeding Rules & CAFO Regulations, Indiana Department of Environmental Management
- Agricultural Waste Management Field Handbook – Part 651, “National Engineering Handbook”, USDA-NRCS, April 1992.
- NRCS Soil Data Mart
- Purdue University publications:
  - AY-277, 1993, *Calculating Manure and Manure Nutrient Application Rates*
  - AY-278, 1993, *Estimating Manure Spreader Capacity*
  - AY-281, 1994, *Soil Sampling for P, K and Lime Recommendations*
  - AY-9-32, 1996, *Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa*
  - ID-101, 1994, *Animal Manure as a Plant Nutrient Resource*
  - ID-198, *Crop Production Recordkeeping System*
- Purdue University Manure Management Planner (MMP) software – current version
- Certified Soil Testing Labs – Purdue University and USDA Farm Service Agency
- Manure Testing Labs – PU publication, CES-227, 1990, updated 2001, *How and Where to Get a Livestock Manure Analysis*